

## CLAIMS

What is claimed is:

1. A battery, comprising an anode in electrical communication with a cathode, a separator that separates said anode and said cathode, a means for electrical communication between said anode and said cathode, wherein said anode and said cathode is a carbon nanotube.
2. The battery of claim 1, wherein said carbon nanotube is selected from the group consisting of multi-walled nanotubes, single-walled nanotubes, nanohorns, nanobells, peapods, buckyballs and a combination thereof.
3. The battery of claim 2, wherein said carbon nanotube comprises single-walled nanotubes.
4. The battery of claim 3, wherein said single-walled nanotube is charged up to  $\text{Li}_1\text{C}_3$ .
5. The battery of claim 1, wherein said separator comprises a lithium salt electrolyte.
6. The battery of claim 5, wherein said electrolyte is a PEP electrolyte.
7. The battery of claim 1, wherein said carbon nanotube has a reversible capacity in excess of 600 mAh/g.
8. The battery of claim 1, wherein said carbon nanotube alkali saturation is  $\text{MC}_8$ , wherein M is selected from the group consisting of K, Rb, and Cs.
9. The battery of claim 1, wherein said carbon nanotubes are lithiated.

10. The battery of claim 1, wherein said anode is a  $\text{LiC}_3$  anode.
11. The battery of claim 1, wherein said cathode is comprised of single-walled nanotubes, and wherein said anode is comprised of multi-walled nanotubes.
12. The battery of claim 11, wherein said multi-walled nanotubes are lithiated.
13. The battery of claim 11, wherein said single-walled nanotubes are essentially pure nanotube material.
14. The battery of claim 1, wherein said anode comprises lithiated single-walled nanotubes, and wherein said cathode comprises single-walled nanotubes doped in a lithium metal oxide.
15. The battery of claim 14, wherein said lithium metal oxide is  $\text{LiNiCoO}_2$ .
16. The battery of claim 1, wherein said anode comprises single-walled nanotubes, and wherein said single-walled nanotubes have been treat with a gas selected from the group consisting of  $\text{CO}_2$ ,  $\text{CO}$ ,  $\text{NO}_2$ ,  $\text{NO}$ ,  $\text{N}_2\text{O}$ ,  $\text{O}_2$ , peroxides,  $\text{O}_3$ ,  $\text{SO}_2$ , and  $\text{CH}_2\text{CO}$ .
17. The battery of claim 1, wherein said anode comprises lithiated single-walled nanotubes, and wherein said cathode comprises fluorinated single-walled nanotubes.
18. The battery of claim 1, wherein said anode comprises lithiated multi-walled nanotube buckypaper, and wherein said cathode comprises single-walled nanotube buckypaper.
19. The battery of claim 1, wherein said anode comprises a conducting polymer-doped single-walled nanotubes, and wherein said cathode comprises of essentially pure single-walled nanotubes.

20. The battery of claim 1, wherein said anode comprises single-walled nanotubes, and wherein said cathode comprises  $\text{LiNiCoO}_2$ .
21. The battery of claim 1, wherein said electrolyte is a nonflammable polyether phosphate liquid together with a lithium salt.
22. The battery of claim 1, wherein said anode comprises a lithium composite, and wherein said cathode comprises essentially pure single-walled nanotube material.
23. The battery of claim 22, wherein said lithium composite is  $\text{LiSiC}$ .